

# **Exhibit “G”**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
TYLER DIVISION**

CELLULAR COMMUNICATIONS  
EQUIPMENT LLC,

Plaintiff,

v.

LG ELECTRONICS, INC., ET AL.,

Defendants.

Civil Action No. 6:14-cv-982-JRG  
LEAD CASE

**DECLARATION OF CLAUDE ROYER**

I, Claude Royer hereby declare:

1. I have been engaged by Plaintiff Cellular Communications Equipment LLC ("CCE") in connection with the above-captioned lawsuit to provide my analyses and opinions on certain technical aspects of this dispute. I understand this Declaration is intended as support for a submission by CCE regarding claim construction. The general purpose of this Declaration is to provide my views as to what a person of skill in the art of the Patents would understand from the disclosures about certain technical issues that relate to the parties' disputes over claim construction.

2. I am competent to testify to the matters stated in this declaration, have personal knowledge of the facts and statements herein, and each of the statements is true and correct.

3. I understand that defendants in this case may produce an expert declaration supporting their constructions and/or indefiniteness positions, and I reserve the right to supplement or amend my opinions here upon reviewing the same and/or to produce a rebuttal statement, if necessary.

4. I am being compensated at the rate of \$265 per hour for my work in connection with these cases. My compensation is not dependent in any way on the contents of this declaration, the substance of any further opinions or testimony that I may provide, or the outcome of these cases.

## **I. QUALIFICATIONS**

5. I have been actively engaged as a wireless telecommunications engineer since 1988. I am the Founder and President of Claude Royer Consultant Inc., a professional practice of technical consulting services. The focus of the practice is Wireless patent portfolio evaluation, verification of intellectual property infringement and Wireless system design.

6. From 2009 to 2011, I was Director of Wireless Access Research at Research In Motion LTD (RIM), the manufacturer of BlackBerry handsets and a

telecommunications service provider, giving technical direction in the creation of new protocols applicable to LTE Advanced and next generation Wireless systems. From 2007 to 2008, I was Director of Carrier Network Technology at Nortel Networks Ltd., a telecommunications equipment vendor, where I led a team that created and implemented new context-aware data and voice services for Wireless operators. From 1997 to 2006, I directed the Wireless Access Systems team at Nortel, which researched and presented to standards bodies new protocols and technologies for second, third and fourth generation Wireless systems, including GSM/EDGE, 1xEvDO, UMTS/HSPA, WiMax and LTE. I was also leading a team which implemented these technologies into base station and terminal prototypes. Prior to that, from 1994 to 1996, I managed the development team in the Nortel Wireless Networks division that introduced the world's first software defined cellular packet data radio system. From 1988 to 1994, I worked as a signal processing engineer, designing and implementing first and second generation cellular base stations, within the team that created the world's first software-defined radio for analog and digital cellular voice service. At the University of Toronto, where I was a Research Assistant from 1985 to 1987, I designed and developed prototypes for a real-time signal processing system for analysis of Doppler signals embedded in radio frequency signals.

7. I received a Bachelor's Degree in Engineering Physics, in 1985 from Université Laval in Quebec City, and a MAsC. in Electrical Engineering in 1987 from the University of Toronto.

8. I am a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and a registered Professional Engineer in the Province of Quebec.

9. I am a named inventor on more than 23 issued patents and have provided numerous technical presentations to RIM and Nortel customers about new Wireless products and technologies.

10. I have received numerous honors in connection with my work in wireless

engineering, including Nortel Networks Platinum Talent Award, Nortel Networks Inventor Awards and a Nortel Telecom Award for customer service.

11. A complete list of my qualifications is set forth in my curriculum vitae, a current copy of which is attached hereto at the end of my Declaration.

12. In connection with preparation of this Declaration, I have reviewed:

- a) U.S. Patent No. 8,645,786 ("the '786 Patent"), entitled "Decoding Method," and its prosecution history.
- b) U.S. Patent No. 8,254,872 ("the '872 Patent"), entitled "Simplified Method for IMS Registration in the Event of Emergency Calls," and its prosecution history.
- c) U.S. Patent No. 7,218,923 ("the '8923 Patent"), entitled "Control of Terminal Applications in a Network Environment," and its prosecution history.
- d) The P.R. 4-3 disclosures exchanged in this case.
- e) The letter brief defendants submitted regarding alleged indefiniteness of certain claim terms, as well as Defendants' claim construction brief.

The '786 Patent, '872 Patent, and '8923 Patent are collectively referred to as "the Patents."

13. I am also familiar with contentions of the parties as to the meaning of terms of the claims.

## **II. THE PATENTS AND LEVEL OF ORDINARY SKILL IN THE ART**

14. I understand that the proper construction of the patent claims should be based on the understanding of a person of ordinary skill in the art ("POSA"), and that the characterization of that person is based on the following non-exclusive factors: (1) the type of problems encountered in the art; (2) the prior art solutions to those problems; (3) the rapidity with which innovations are made; (4) the sophistication of the

technology; and (5) the educational level of active workers in the field. I have considered these factors. I understand that the relevant time frame for resolving the level of ordinary skill in the art is the time of the invention.

15. Based on the overall disclosures and claims of the Patents, I understand the scope of the inventions to generally relate to wireless data communication networks and related protocols and techniques (including standardized protocols and techniques applicable to UMTS and LTE networks).

16. The '786 Patent was filed September 15, 2005, and claims priority to a foreign application filed September 15, 2004. The Abstract states as follows:

A decoding method for decoding information content in at least one data packet, which is transmitted from a sender to a receiver via a data link. The information is represented by a bit sequence, which is transformed into a transmittable redundancy version. The information is initially transmitted for a first time in a first data packet from the sender to the receiver. The information is represented by a first redundancy version, which is self-decodable. An incorrect receipt is confirmed by sending a confirmation from the receiver to the sender. The information is retransmitted at least a second time in a second data packet from the sender to the receiver upon receipt of the confirmation, wherein, for representation of the information, a second redundancy version is used, the selection of which is performed in dependence on a coding parameter, describing whether the redundancy version is self-decodable or not..

17. In my opinion, a POSA of the '786 Patent would have completed an undergraduate program in electrical engineering or computer science and would have at least 5 years of professional experience in the field of mobile wireless communications. Alternatively, that person would have completed a graduate program in electrical engineering or computer science and would have at least 2 years of professional experience in the field of mobile wireless communications. The POSA would understand the structure and functions of wireless communication networks, including wireless networks that were in use and under development at the time of the Patent.

18. The '872 Patent was filed April 13, 2007, and claims priority to a foreign application filed April 27, 2006. The Abstract states as follows:

Simplification of IMS registration in the event of emergency calls is made possible by apparatuses and a method for setting up an emergency-call connection from a terminal to an IMS via a network visited by the terminal, where, if the terminal is already registered in the IMS, setup of an emergency-call connection dispenses with IMS registration of the terminal in the IMS for this emergency-call connection if a comparison between a network identification for the visited network, of which the terminal was notified when it registered in the visited network, and a network identification for the terminal's home network reveals a match between these network identifications.

19. In my opinion, a POSA of the '872 Patent would have completed an undergraduate program in electrical engineering or computer science and would have at least 5 years of professional experience in the field of mobile wireless communications. Alternatively, that person would have completed a graduate program in electrical engineering or computer science and would have at least 2 years of professional experience in the field of mobile wireless communications. The POSA would understand the structure and functions of wireless communication networks, including wireless networks that were in use and under development at the time of the Patent.

20. The '8923 Patent was filed June 8, 2004, and claims priority to a foreign application filed December 18, 2003. The Abstract states as follows:

A mechanism and method for controlling the rights and/or behavior of applications in a terminal, especially in a mobile terminal, are disclosed. At least some of the messages generated by an application residing in the terminal and destined for a communication network are diverted to an independent controlling entity also residing in the terminal. In the controlling entity, the messages are controlled before being transmitted to the network. Depending on the application and its behavior in the terminal, the control entity may modify the messages or even prevent their sending to the network. The modification may include inserting control data, such as a digest, which can be used to authenticate the

application.

21. In my opinion, a POSA of the '8923 Patent would have completed an undergraduate program in electrical engineering or computer science and would have at least 5 years of professional experience in the field of mobile operating systems. Alternatively, that person would have completed a graduate program in electrical engineering or computer science and would have at least 2 years of professional experience in the field of mobile operating systems. The POSA would understand the structure and functions of mobile operating systems, including mobile operating systems that were in use and under development at the time of the Patent.

22. I possess at least the ordinary skill in the art applicable to each Patent, and I have applied those standards throughout my analysis. The statements and opinions expressed in this Declaration are based on my knowledge and experience as one of at least ordinary skill in the art for each Patent at the time of the invention (which I understand to be the earliest priority date of each application).

### **III. LEGAL STANDARDS**

23. I understand that the words of a claim are generally given the ordinary and customary meaning that the term would have to the POSA at the time of the invention.

24. I understand that, in construing terms, Courts look first to the intrinsic evidence of record, which includes the patent itself (including the claims and specification) and the prosecution history. I also understand that Courts may consider extrinsic evidence, such as expert and inventor testimony, dictionaries, and learned treatises.

25. I understand that particular embodiments appearing in the written description will not be used to limit claim language that has broader effect. And, even where a patent describes only a single embodiment, claims are not to be read



restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.

26. I understand that a person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which it appears, but also in the context of the entire patent, including the specification and prosecution history.

27. I understand that while claim terms are understood in light of the specification, the scope of the claims is not necessarily limited to inventions that look like the ones shown in the figures and described in the specification. I realize that limiting claims from the specification is generally not permitted absent a clear disclosure that the patentee intended the claims to be limited as shown.

28. I understand that differences among claims can also be a useful guide in understanding the meaning of particular claim terms. For example, I am familiar with the doctrine of “claim differentiation” where the presence of a dependent claim that adds a particular limitation to an independent claim gives rise to a presumption that the limitation in question is not present in the independent claim.

29. I understand that, through the user of means-plus-function limitations, patentees may claim an element of a combination functionally, without reciting structures for performing those functions. Such limitations are construed to cover the corresponding structure described in the specification. This process requires first determining the function of the means-plus-function limitation, and then determining the corresponding structure disclosed in the specification. A structure is corresponding if the specification or file history clearly links or associates it to the function recited in the claim.

30. I understand that there is a rebuttable presumption that a claim term is not a means-plus-function limitation if it does not recite “means.” To determine whether such a limitation is nonetheless subject to 35 U.S.C. § 112 ¶ 6, inquiry is

whether the limitation, read in light of the claim language, specification, prosecution history, and relevant extrinsic evidence, has sufficiently definite structure to a person of ordinary skill in the art.

31. I understand that, for means-plus-function limitations where the disclosed structure is a computer programmed to implement an algorithm, the patent must disclose enough of an algorithm to provide the necessary structure under 35 U.S.C. § 112 ¶ 6. The patentee may express this algorithm in any understandable manner, including as a mathematical formula, in prose, or as a flowchart, so long as it provides sufficient structure. The patentee need not disclose details of structures well known in the art. Sufficient structure must simply permit one of ordinary skill in the art to know and understand what structure corresponds to the means limitation so that he may perceive the bounds of the invention. That is, the patent need only disclose sufficient structure for a person of skill in the field to provide an operative software program for the specified function.

32. I understand that there is an exception to the requirement that an algorithm must be disclosed for a general-purpose computer to satisfy the disclosure requirement under 35 U.S.C. § 112 ¶ 6 when the function can be achieved by any general purpose computer without special programming. That is, a general-purpose computer is sufficient structure if the function of a term requires no more than that which any general-purpose computer may do without any special programming.

33. I understand that the standard for indefiniteness is whether a POSA would understand what is claimed when the claim is read in light of the specification and prosecution history. A claim is indefinite if, viewed in light of the specification and prosecution history, it fails to inform one skilled in the art about the scope of the invention with “reasonable certainty.” The definiteness requirement must take into account the inherent limitations of language. Reasonable certainty in light of the subject

matter, not absolute precision, is required. Indefiniteness is an invalidity defense and, as such, must be demonstrated by clear and convincing evidence.

#### IV. DISPUTED CLAIM TERMS

##### A. '786 Patent – “self decodable rate matching patterns” (Claim 1)

34. I understand the parties have proposed the following constructions of the term “self decodable rate matching patterns” found in Claim 15:

CCE's Proposed Construction	Defendants' Proposed Construction
“rate matching patterns”: “patterns for puncturing and/or repeating bits” “self-decodable”: no construction necessary	This term is indefinite under 35 U.S.C. § 112, ¶ 2.

35. The '786 Patent relates to an improved technique for transmitting (and retransmitting) information in a cellular network. In particular, it describes a particular method for communicating information according to a Hybrid Automatic Repeat reQuest (HARQ) scheme. The patent explains that, in a HARQ scheme, “packets are transmitted, and if they are not received correctly, a retransmission is transmitted upon received of a negative confirmation of the receiver, a so called ‘not acknowledge’ (NACK) ... In the case of more than one transmission of the same data packet, at the receiver both the initial transmission and the retransmission is used for decoding the packet.” '786 Patent at 1:22-31. The '786 Patent further explains:

According to the invention, a data packet is transmitted from a sender to a receiver. In the data packet information is contained, which is represented by a bit sequence. For transmission this bit sequence is transformed into a redundancy version [“RV”], that is one out of more possible representations suited for transmission. In case the receiver does not receive the data packet correctly, it sends a conformation, e.g. a NACK, to the sender. Upon this receipt the sender retransmits the information in a second data packet, which might be different from the first one. For this retransmission a second redundancy version is used, which might be different from the first one. The selection of the redundancy version for

the second transmission is based on a coding parameter, which denotes whether the redundancy version is self-decodable, that means decodable only by itself or not.

*Id.* at 2:46-60. This technique can be used improve the efficiency of cellular communications without significantly increasing signaling requirements. *Id.* at 61-67.

36. Claim 1 of the '786 Patent states:

1. A method of transmitting an information content contained in at least one data packet transmitted from a sender to a receiver via a data link, wherein the information is represented by a bit sequence that is enclosed into a transmittable redundancy version, the method comprising the steps of:

- a) initially transmitting the information for a first time in a first data packet from the sender to the receiver, wherein the information is represented by a first, self-decodable redundancy version and a first rate matching pattern selected from a set of at least two self decodable rate matching patterns which are determined by a redundancy version parameter indicating a rate matching pattern;
- b) receiving a confirmation confirming an incorrect receipt from the receiver at the sender;
- c) retransmitting the information at least one first time in a second data packet from the sender to the receiver upon receipt of the confirmation in step b), thereby using a second redundancy version for representation of the information, selecting the redundancy version in dependence on a coding rate, and selecting a self-decodable redundancy version if the coding rate is lower than a predefined upper coding rate and selecting a further rate matching pattern using the redundancy version parameter, which further rate matching pattern is different to that used in the first data packet; and
- d) retransmitting the information at least a second time in a third data packet from the sender to the receiver upon receipt of a further confirmation confirming an incorrect receipt from the receiver to the sender, thereby using a third redundancy version in dependence on a coding rate, and selecting a self-decodable redundancy version if the coding rate is higher than the predefined upper coding rate and selecting a rate matching pattern using the redundancy

version parameter, which rate matching pattern is different from the first rate matching pattern used in the first data packet and the same as the further rate matching pattern used in the second data packet.

37. The disputed language in Claim 15, “self decodable rate matching patterns,” is underlined above.

38. The specification of the '786 Patent provides guidance as to the meaning of “self decodable rate matching patterns.” As an initial matter, the '786 Patent explains that a “self-decodability” refers to prioritizing systematic (i.e., data) bits over parity (i.e., redundant) bits “when puncturing during rate matching” so that the RV contains enough information data to be decodable by itself:

The parameter  $s$  specifies whether the RV is self decodable, this means decodable if only this RV is considered. Decodable means in this respect, that the information content of the data packet, represented by the redundancy version can be found out. **If  $s=1$ , then when puncturing during rate matching the so called systematic bits are prioritized over the parity bits of the turbo code.** Such a redundancy version is typically self decodable, that means, that it can be decoded by itself, unless of course the reception is too noisy. This is not the case when  $s=0$  (parity bits are prioritized), where it can happen that a RV cannot be decoded by itself, even in the absence of noise, but only together with another RV. Therefore the first transmission of a packet should always be self-decodable, i.e. employ  $s=1$ .

'786 Patent at 8:39-52 (emphasis added). As that term is used in the '786 Patent, “self-decodability” is not an absolute quality of received information, but a characteristic describing how information is represented prior to transmission. This is consistent with the ordinary meaning of that term, as understood by a POSA in the context of 3GPP cellular network technologies.

39. Further, the '786 Patent explains that “rate matching patterns” are “patterns for puncturing and/or repeating bits.” For instance, the patent explains: “Rate matching is the puncturing or repeating of bits in order to achieve a desired final

number of data in a certain time interval or correspondingly a desired data rate.” ’786 Patent at 9:35-38. This reflects the ordinary use of the term “rate matching pattern” in the field of cellular communications and 3GPP networks, and corresponds to the ordinary meaning to a POSA. That ordinary meaning is further confirmed by the discussion of rate matching and rate matching patterns are found in columns 7 and 8 of the ’786 Patent.

40. I disagree with Defendants’ contention that “[t]he ’786 Patent and its file history teach away from the rate matching pattern having any relationship to self-decodability.” Dkt 128-1 at 2.

41. First, as explained in the preceding paragraphs, “rate matching patterns” are patterns for puncturing and/or repeating bits, and “self decodability” refers to what bits (systematic or parity) are prioritized “when puncturing during rate matching.” Additionally, the ’786 Patent explains that “the parameters of the rate matching stage depend on the value of the RV parameters  $s$  and  $r$ .”

42. Thus, the ’786 Patent makes clear that both parameter  $r$  and  $s$  define the rate matching pattern. That is, for all other factors being equal, a change in the value of parameter  $s$  will result in different rate matching pattern, even if parameter  $r$  is unchanged, by the virtue of different systematic bits and parity bits being punctured depending on the value of parameter  $s$ . In fact, the ’786 Patent confirms that the different rate matching pattern obtained by varying parameter  $s$  for a given parameter  $r$  may or may not result in a self-decodable data packet. ’786 Patent at 8:39-52. The self-decodable property of a data packet therefore results directly from the rate matching pattern that produced the packet. The phrase “self-decodable rate-matching patterns” would therefore make perfect sense to one skilled in the art. A self-decodable rate matching pattern will produce self-decodable information by prioritizing systematic bits rather than parity bits during rate matching.

43. Accordingly, it is my opinion that a POSA would understand that the

scope of the term “self decodable rate matching pattern” in Claim 1 refers to rate matching patterns applied to prioritize systematic bits (rather than parity bits), thereby producing a self-decodable redundancy versions.

44. Thus, for the reasons explained above, it is my opinion that the term “self decodable rate matching pattern” used in the claims of the ’786 Patent is clear, and the claims of that inform, with reasonable certainty, the scope of the invention to persons of ordinary skill in the art.

#### **B. ’872 Patent**

45. The ’872 Patent relates to a simplified technique for IMS registration in the event of emergency calls. ’872 Patent at Abstract. Third-generation Partnership Project (3GPP) technical specifications applicable to UMTS and LTE networks set forth procedures for communicating in an IP Multimedia Subsystem (IMS), a packet-based network capable of supporting both data services and packet-based voice calls (VoIP). *See id.* at 1:13-18. The ’872 Patent explains that, typically, emergency calls made over the IMS network require a special registration procedure. *Id.* at 1:21-25. Unfortunately, that registration procedure wastes time, which is significant in the context of emergency calls. *Id.* at 1:44-47, 2:63-3:3. The patent describes a technique to bypass that time-consuming process in certain circumstances. *Id.* at 2:12-39.

46. Accordingly, the ’872 Patent discloses and claims a “terminal” that can perform a simplified IMS registration procedure. *Id.* at Abstract. In particular, the terminal is registered in a cellular network and receives a network identifier for the network it is visiting and compares that received network identifier with a network identifier of the terminal’s home network. *Id.* at Fig. 1, 2:21-39, 3:19-38; 3:45-51; 4:50-56; 4:64-5:3. It then sets up an emergency call connection in a simplified manner when it is “already registered with the IP multimedia subsystem” and the comparison “reveals a match between the network identifiers.” *Id.* at Fig. 1, 2:34-39; 3:30-42; 3:52-57; 4:57-63; 5:4-10. Additionally, the patent repeatedly references and discusses 3GPP Technical

Standard 23.167 Release 7, titled “IP Multimedia Subsystem (IMS) emergency sessions” (discussed in the ’872 Patent at, e.g., 1:16-26, 1:65-67), which describes characteristics, capabilities, and protocols of terminals that support IMS and emergency calls over IMS. See, e.g., TS 23.167 Release 7.

47. Thus, it is clear from the claims, specification, and even the title of the patent that the “terminal” claimed in the patent is a mobile terminal (also referred to as User Equipment, or “UE”) that supports communications, including registration and emergency calls, over an IP multimedia subsystem. Those skilled in the art would know that the claimed terminal is configured to support 3GPP protocols related to IMS, all of which are well-known, and must include the ordinary components (including a receiver, memory, IMS client, and logic) that reside in such mobile terminals.

**1. Alleged Means-Plus-Function Terms: “connection unit,” “comparator,” and “receiver” (Claims 13, 14, 16, 17, and 18)**

48. I understand the parties have proposed the following constructions of the term “receiver” found in Claims 13, 17, and 18:

CCE’s Proposed Construction	Defendants’ Proposed Construction
No construction necessary. Not subject to 35 U.S.C. 112(6).	<p>Indefinite.</p> <p>This is a means-plus-function element to be construed in accordance with 35 U.S.C. § 112, ¶ 6.</p> <p>Function: “receive a network identifier of a visited network notified to a terminal when the terminal is registered in the visited network”</p> <p>Structure: no corresponding structure disclosed</p>

49. Claims 13, 17, and 18 recite:

13. A terminal, comprising:  
a receiver configured to receive a network identifier of a visited



- network notified to the terminal when the terminal is registered in the visited network;
- a comparator configured to compare the received network identifier of the visited network with a network identifier of a home network of the terminal; and
- a connection unit configured to set up an emergency call connection wherein an IP multimedia subsystem registration of the terminal in an IP multimedia subsystem for the emergency call connection is dispensed with when the terminal is already registered in the IP multimedia subsystem and the comparator reveals a match between the network identifiers.

17. A terminal according to claim 13, wherein the receiver is configured to receive a network identifier which comprises at least one of a mobile country code and a mobile network code.

18. A terminal according to claim 13, wherein the receiver is configured to receive a network identifier from the visited network, wherein the visited network comprises one of a cellular network, a wireless local area network, a WIMAX network, and a fixed network.

50. As noted above, the '872 Patent makes clear that the "terminal" claimed in the patent is a mobile terminal that supports communications over an IP multimedia subsystem.

51. A "receiver" is a well-known, discrete component of the IMS-capable mobile terminal described in the specification, and one of ordinary skill in the art would understand that the '872 Patent uses the term "receiver" to refer to a structural component of an IMS-capable mobile terminal. In particular, a receiver is a component in a terminal that receives signals, messages, and other information from a mobile network and extracts content included in such signals, messages, or other information. Such a receiver interacts with other components within a terminal by passing information to them (such as a memory and a baseband processor) so that the terminal device can respond to and communicate with base stations in the mobile network.

52. Indeed, a receiver is required for a mobile device to support IMS communications, including those explicitly discussed in the '872 Patent. *See, e.g.,* '872 Patent at Abstract ("the terminal is already registered in the IMS"); Figure 1 ("Terminal registers in the mobile radio network...Terminal registers in the IMS (SIP REGISTER); 1:23-26 ("[3GPP] TS 23.167 is currently based on the fact that a terminal which wishes to transmit an emergency call in the IMS first registers in the IMS by means of an emergency call IP URI"); 2:50-51 ("In the case of emergency calls, the terminal can immediately set up the SIP session by means of an SIP INVITE message"); 3:19-42 ("A terminal (FIG. 1, "terminal") registers in a mobile radio network and obtains a network identifier ("MCC1/MNC1") of the mobile network visited by it...the terminal does not perform a special (separate/further) registration for the emergency call desired by it but immediately sets up the emergency call by means of a "SIP INVITE" message.").

53. Accordingly, it is my opinion that the term "receiver" used in the claims of the '872 Patent conveys known structure to a person skilled in the art.

54. I understand the parties have proposed the following constructions of the term "comparator" found in Claims 13 and 14:

CCE's Proposed Construction	Defendants' Proposed Construction
No construction necessary. Not subject to 35 U.S.C. 112(6).	<p>Indefinite.</p> <p>This is a means-plus-function element to be construed in accordance with 35 U.S.C. § 112, ¶ 6.</p> <p>Function: "compare the received network identifier of the visited network with a network identifier of a home network of the terminal"</p> <p>Structure: no corresponding structure disclosed</p>

55. Claims 13 and 14 recite:

13. A terminal, comprising:

- a receiver configured to receive a network identifier of a visited network notified to the terminal when the terminal is registered in the visited network;
- a comparator configured to compare the received network identifier of the visited network with a network identifier of a home network of the terminal; and
- a connection unit configured to set up an emergency call connection wherein an IP multimedia subsystem registration of the terminal in an IP multimedia subsystem for the emergency call connection is dispensed with when the terminal is already registered in the IP multimedia subsystem and the comparator reveals a match between the network identifiers.

14. A terminal according to claim 13, wherein the connection unit is configured to set up the emergency connection over an already existing IP multimedia subsystem registration if the comparator reveals a match between the network identifiers.

56. As noted above, the '872 Patent makes clear that the "terminal" claimed in the patent is a mobile terminal that supports communications over an IP multimedia subsystem.

57. A "comparator" is also a known structural component of the IMS-capable mobile terminal described in the specification. Specifically, one skilled in the art would understand that the term "comparator" in the '872 Patent refers to basic logic circuitry that compares values stored in memory to determine whether they match (e.g., an "if x = y" statement). Such a comparator is a basic structural component of an IMS-capable mobile terminal such as described and claimed in the '872 Patent, and is essential to determine whether values, such as network identifiers, match.

58. This understanding of "comparator" is confirmed by the claim language, which states that the claimed comparator compares two stored identifiers to determine if the match. '872 Patent at 5:1-10 ("a comparator configured to compare the received network identifier of the visited network with a network identifier of a home

network...the comparator reveals a match between the network identifiers”). It is also confirmed by the specification’s description of this comparison of stored values. ’872 Patent at 2:30-32 (“the comparison between the stored identifier of the one network and the received identifier of the visited network has revealed that both networks are identical”); 3:30-38 (“a comparison of the network identifier “MCC1/MNC1” (stored in the terminal after its registration/authentication etc. in the mobile radio network visited by it) ... with the network identifier “MCC2/MNC2” of the network in which the P-CSCF is located, reveals that the P-CSCF is located in the network visited by the terminal”).

59. Accordingly, it is my opinion that the term “comparator” used in the claims of the ’872 Patent conveys known structure to a person skilled in the art.

60. I understand the parties have proposed the following constructions of the term “connection unit” found in Claims 13 and 14:

CCE’s Proposed Construction	Defendants’ Proposed Construction
No construction necessary. Not subject to 35 U.S.C. 112(6).	<p>Indefinite.</p> <p>This is a means-plus-function element to be construed in accordance with 35 U.S.C. § 112, ¶ 6.</p> <p>Function: “set up an emergency call connection”</p> <p>Structure: no corresponding structure disclosed</p>

61. Claims 13 and 14 recite:

13. A terminal, comprising:

a receiver configured to receive a network identifier of a visited network notified to the terminal when the terminal is registered in the visited network;

a comparator configured to compare the received network identifier of the visited network with a network identifier of

- a home network of the terminal; and
- a connection unit configured to set up an emergency call connection wherein an IP multimedia subsystem registration of the terminal in an IP multimedia subsystem for the emergency call connection is dispensed with when the terminal is already registered in the IP multimedia subsystem and the comparator reveals a match between the network identifiers.

14. A terminal according to claim 13, wherein the connection unit is configured to set up the emergency connection over an already existing IP multimedia subsystem registration if the comparator reveals a match between the network identifiers.

62. As noted above, the '872 Patent makes clear that the "terminal" claimed in the patent is a mobile terminal that supports communications over an IP multimedia subsystem.

63. One of ordinary skill in the art would understand that the term "connection unit" in the claims of the '872 Patent refers to a structural component of an IMS-capable mobile terminal, namely, a SIP client. More specifically, one skilled in the art would have knowledge of SIP and IMS protocols and processes, including those detailed in 3GPP TS 23.167, which the the '872 Patent expressly discusses, and would know that the "connection unit" of a terminal which sets up an IMS emergency call is a SIP client. Such a connection unit (SIP client) is a well-known software component of an IMS-capable mobile terminal that interacts with other components of the terminal, including the comparator.

64. This understanding is informed and confirmed by the claim language, which explains that the "connection unit" is the terminal component which sets up an emergency call connection when the terminal is already registered in an IMS. '872 Patent at 5:4-10. This occurs when "the comparator reveals a match between the network identifiers," confirming that the connection unit interacts with the comparator. '872 Patent at 5:4-10. Additionally, the specification explains that the terminal sets up

an emergency call by sending a Session Initiation Protocol (“SIP”) INVITE message in accordance with the applicable 3GPP technical standards. ’872 Patent at 1:22-31 (“[3GPP] TS 23.176 is currently based on the fact that a terminal which wishes to transmit an emergency call in the IMS first registers in the IMS by means of an emergency call SIP URI...This SIP URI (Session Initiation Protocol Uniform Resource Identifier) is either preconfigured in the terminal or the terminal generates it from an existing SIP URI which is stored, e.g., on the UICC...”); 2:51-52 (“In the case of emergency calls, the terminal can immediately set up the SIP session by means of an SIP INVITE message”); 3:39-42 (“the terminal...immediately sets up the emergency call by means of a ‘SIP INVITE’ message”).

65. This understanding is also informed and confirmed by applicable technical standards and literature, such as 3GPP Technical Standard 22.944 v.6.0.0, which explains that the “SIP client” (abbreviated “SC”) “terminates IMS signaling in the user equipment” and “is responsible for all the control signaling between the user equipment and elements of the IMS domain in the network.”

66. Accordingly, it is my opinion that the term “connection unit” used in the claims of the ’872 Patent conveys known structure to a person skilled in the art.

**C. ’8923 Patent – “controlling entity” (Claims 1, 4, 24, 26)**

67. I understand the parties have submitted the following constructions for the term “controlling unit,” found in claims 1, 4, 24, and 26 of the ’8923 Patent:

CCE’s Proposed Construction	Defendants’ Proposed Construction
<p>No construction necessary. Not subject to 35 U.S.C. 112(6).</p> <p>Alternatively, should the Court determine this term is subject to 35 U.S.C. 112(6):</p> <p>Function: controlling, based on the message and before the message is transmitted to the communication</p>	<p>Indefinite.</p> <p>This is a means-plus-function element to be construed in accordance with 35 U.S.C. § 112, ¶ 6.</p> <p>Function: “controlling...whether the application program behaves in a</p>

<p>network, whether the application program behaves in a predetermined manner in the communication terminal.</p> <p>Structure: trusted entity/agent 212 (and equivalents). See, e.g., 1:59-2:67, 3:57-66, 4:46-54, 4:20-42, 6:27-48, 6:49-67, 7:13-8:19, 4:63-5:5 and in Figs. 2-3 and 5-10.</p> <p>Alternatively, should the Court determine an algorithm is required, the structure is: trusted entity/agent 212 configured to perform one or more of the algorithms described in the '8923 patent at Abstract, 1:63-2:11, 4:61-5:2, 6:27-48, Figs. 2-3 and 5-6 (and equivalents).</p>	<p>predetermined manner”</p> <p>Structure: no corresponding structure disclosed</p>
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68. The '8923 Patent describes a mechanism and method for controlling the rights and/or behavior of applications in a mobile terminal. '8923 Patent at Abstract. The patent explains that multimedia devices based on open development platforms allow independent application developers to design new services and applications, providing many options for users. *Id.* at 1:31-37. However, a drawback to open development platforms is the possibility that “deceptive application developers” might misuse that environment to develop applications that misbehave by, for example, sending unapproved or improper messages in violation of network policies. *See id.* at 1:38-47. Accordingly, the '8923 Patent provides a software solution that includes a “diverting unit” which can divert a message sent from an application to a “controlling entity” that can control whether the application behaves in a predetermined manner. *Id.* at 9:10-22; *see also id.* at 4:46-5:4, 6:26-48.

69. Claims 1, 4, 24, and 26 recite:

1. A method for controlling application programs in a communication terminal, the method comprising:
  - sending messages from an application program towards a communication network, the application program residing

in a communication terminal;  
diverting a message of the messages to a controlling entity  
residing in the communication terminal; and  
based on the message, controlling in the controlling entity  
whether the application program behaves in a  
predetermined manner in the communication terminal, the  
controlling being performed before the message is  
transmitted from the communication terminal to the  
communication network.

4. The method according to claim 1, wherein the controlling  
comprises preventing the message diverted to the controlling  
entity from being transmitted to the communication network.

24. A terminal for a communication system, the terminal  
comprising:

an application program configured to send messages towards a  
communication network; and

a diverting unit configured to divert a message of the messages  
sent from the application program and destined for the  
communication network to a controlling entity residing in  
the terminal,

wherein the controlling entity is configured to control, based  
on the message and before the message is transmitted to the  
communication network, whether the application program  
behaves in a predetermined manner in the communication  
terminal, and

wherein the terminal is a terminal of a communications  
system.

26. The terminal according to claim 24, wherein the  
controlling entity is configured to reside in a tamper resistant area  
of the terminal.

70. In my opinion, a POSA would understand “controlling entity,” as that  
term is used in the claims, has definite meaning as the name for structure, i.e., specific  
control software residing in the claimed terminal.

71. This is clear from the claims and specification. First, Claims 1 and 24  
reference a “terminal” that comprises an application program configured to send



messages toward a communications network and a “diverting unit” configured to divert a message sent from the application program to a “controlling entity,” which per claim 26 may reside in a “tamper resistant area” of the terminal.

72. It is well known by those of skilled in the art that an “application program” is software. A POSA would also know that any “message” sent from an application to another entity within the terminal is an electronic data structure generated and interpreted by software. Thus, the claim language states that the “controlling entity” takes action based on a data structure (a message) and controls whether software (the application program) behaves in a predetermined manner, making clear that the “controlling entity” is specific control software that interacts with other software components and data structures. A POSA would recognize such a software component as physical structure comprised of executable program code, in the same way the application program is structure.

73. This is further confirmed in the specification, which explains:

FIG. 2 is a schematic illustration of one embodiment of a terminal according to the invention. The entities relevant to the invention reside in a tamper resistant area 200 of the terminal or in an open platform area 201. The tamper resistant area includes at least one trusted agent 212, which acts as a controlling entity controlling the rights and behavior of the applications. The trusted agent may be a dedicated software agent or a Digital Rights Management (DRM) agent whose normal functionality has been modified for the method of the invention.

’8923 Patent at 3:57-66. This passage explains that the “controlling entity” may be a “dedicated software agent” or a modified “DRM agent.”

74. Particular embodiments are further described in column 4:

If the application identifier is found in the repository, the repository returns a positive response (step 6) indicating that the application needs to be controlled. When the protocol stack receives the positive response, it sends the INVITE request to the trusted agent (step 7). The trusted agent then examines the request and checks, whether the application behaves as it should be behaving (step 8). The trusted agent may modify the request,

for example by adding control data, such as control parameters, to the request. As discussed below, the trusted agent may also prohibit the sending of the request.

*Id.* at 4:46-65. This passage explains that the “trusted agent” (an exemplary “controlling entity”) can examine an “INVITE request” (an exemplary message) to check whether the application that sent it is behaving appropriately. A variation of this embodiment is described in column 6 at lines 27-41 (“in this embodiment the trusted agent compares the behavior of the application to the policy rules at step 8 ... Depending on the result of the comparison, the trusted agent may then allow or prohibit the sending of the message”).

75. Taken together, these specification passages confirm what the claim itself makes clear: that the “controlling entity” is a control software component that interacts with other software components and data structures, which a POSA would understand to have definite meaning as the name for structure.

76. To the extent a court were to find that “controlling entity” is a means-plus-function limitation, the claimed function would be the function recited in the claim, namely: “controlling ... whether the application program behaves in a predetermined manner in the communication terminal.”

77. Regarding structure, a POSA would understand that the structure clearly linked to this function in the specification is “trusted agent 212.” As noted in the passages cited above, the “trusted agent” “acts as a controlling entity controlling the rights and behavior of the applications,” and “may be a dedicated software agent or a Digital Rights Management (DRM) agent whose normal functionality has been modified for the method of the invention.” *Id.* at 3:57-66; *see also id.* at 4:46-65 (“The trusted agent then examines the request and checks, whether the application behaves as it should be behaving (step 8). The trusted agent may modify the request, for example by adding control data, such as control parameters, to the request. As discussed below,

the trusted agent may also prohibit the sending of the request.”); *id.* at 6:35-41 (“[I]n this embodiment the trusted agent compares the behavior of the application to the policy rules at step 8. Moreover, in this embodiment the type(s) of the messages may be different. Depending on the result of the comparison, the trusted agent may then allow or prohibit the sending of the message, for example.”).

78. To the extent a court were to find that an algorithm for performing the claimed function is required, the corresponding algorithms are disclosed in the specification passages detailed above, which explain that trusted agent 212 performs the function (“controlling ... whether the application program behaves in a predetermined manner in the communication terminal”) by, for example, “examin[ing] the request [i.e., a message] and check[ing], whether the application behaves as it should be behaving” (*see id.* at 4:46-65), “compar[ing] the behavior of the application to the policy rules,” (*see id.* at 6:36-37), and/or “allow[ing] or prohibit[ing] the sending of the message” (*see id.* at 6:39-41). The ’8923 Patent also explains:

At least some of the outbound messages generated by an application in a terminal are diverted to the controlling entity on their way from the application to the network. The controlling entity evaluates whether any changes are needed in the message or in the behavior of the application. Based on the evaluation, the control entity then returns the message intact or in a modified form. The controlling entity may even prohibit the sending of the message, if it detects that the application has no pertinent rights or that the application is not behaving, as it should. The controlling entity resides in a tamper resistant area of the terminal, so that its operation cannot be affected by the user or other parties that are beyond the control of the network operator. The outbound messages of an application are thus controlled by a controlling entity, which is totally independent of the applications residing in the terminal. Due to its nature, the controlling entity is also termed the trusted agent in this context.

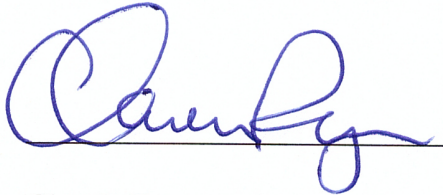
*Id.* at 1:63-2:11. This passages thus states that the “controlling entity” may perform the claimed function by “evaluat[ing] whether any changes are needed in the message or the behavior of the application” and, based on that evaluation, “return[ing] the message

intact or in a modified form” or “prohibit[ing] the sending of the message, if it detects the application has no pertinent rights or ... is not behaving[.]”

79. Thus, for the reasons explained above, it is my opinion that the term “controlling entity” used in the claims of the ’8923 Patent conveys known structure to a person skilled in the art, and the claims of the ’8923 Patent inform, with reasonable certainty, the scope of the invention to persons of ordinary skill in the art.

I declare under penalty of perjury under the laws of the United States that the foregoing

is true and correct. Executed this 13th day of November, 2015 at Gatineau, Canada



Claude Royer



## Claude Royer

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### SUMMARY OF QUALIFICATIONS

A “hands-on” contributor who has created new products, technology and IP for the Wireless ecosystem, spanning radio access infrastructure, core networks and terminals.

Recognized for achievements in the following areas:

- Technical innovation and standards wins
- Creation of technology roadmaps, identification of technical risks, definition of research plans
- Definition and test of complex new systems
- Generation and evaluation of IP
- Infringement assessments and reverse engineering
- Effective interaction with customers and vendors

A “platinum” rated technical leader, known for inspiring others across organizations to meet ambitious goals.

### PROFESSIONAL HISTORY

CLAUDE ROYER CONSULTANT INC.

Ottawa, Ontario

#### President and Principal

**2011-present**

- Created consulting company providing strategic guidance and technical expertise in telecomm.
- Performed evaluations of intellectual property relating to Wireless telecommunication protocols (LTE, HSPA and 802.11), infrastructure and consumer products. Produced and reviewed claim chart and test plans, conducted testing for verification of infringement. Supervised verification team. Completed final analysis of verification results and their reporting. Conducted prior art searches.
- Deponent experience as technical expert in patent litigation.
- Conducted LTE live network measurement campaigns in North America and Asia.
- Architected next generation enterprise Wireless terminal management system integrating 3GPP2 pico/femto cellular access network.
- Proposed options for 3GPP EPS integration of non-3GPP access network, with a focus on mapping QoS and PCC to VSAT access. Conducted configuration and integration with several vendors in a captive network.
- Produced proposals to product management teams, specifications to OEM partners; performed measurements, analysis and recommendations

RESEARCH IN MOTION LTD.

Ottawa, Ontario

#### Director, Advanced Technology

**2009–2011**

- Assembled a team of experts in advanced Wireless network protocols, quickly ramped them up on a mission to create RIM homegrown technologies for LTE, LTE-Advanced and future radio access systems. Organized related patent prosecution efforts.
- Main editor for technical proposal of new Interference Alignment project targeted for LTE-Advanced contributions in 3GPP Release 10 and Release 11.
- Provided and reviewed results of system capacity studies to the Canadian Evaluation Group (CEG) to evaluate fourth generation (4G) candidate technologies for the benefit of ITU. Provided guidance to Industry Canada for the preparation of the now on-going consultation for the 700 MHz band and for the cognitive radio proposals in ITU-R 8A.
- Main editor and contributor to white paper on a novel concept of cognitive underlay to licensed Wireless services. Delivered a BlackBerry Cognitive Radio prototype as a test bed for Dynamic Spectrum Allocations schemes.

- Technical advisor to M&A team in due diligence exercises towards acquisition of Wireless assets.
- Prepared RIM proposal for participation in German joint trial 'NaWinet' program addressing challenges of LTE rural deployments.

NORTEL NETWORKS LTD.

Ottawa, Ontario

**Director, Carrier Networks Technology**

**2007–2008**

- Formed and led a new team developing middleware concepts bringing a rich foundation for context-aware services in 3GPP/3GPP2 networks. Defined architecture for collection of contextual user data through various adapters to network nodes, including PDSN and MSC. Released prototypes for carrier customer engagements and filed fundamental IP. Prepared technology development plans.
- Completed competitive analysis of features & options offering from other vendors, including Openwave Profiling and Personalization System (OPPS) and Bridgewater Policy and Charging Rules Function (PCRF).

**Director, Wireless Technology Labs**

**2000– 2007**

- Spearheaded “world’s first” 4G system definition and prototype, showcased to all Wireless carrier customers. Developed the strategy for creation of Nortel solutions in MIMO-OFDM and SDMA,
- Prioritized contributions to CDMA evolution (EV-DV, EV-DO), 3GPP (UMTS, LTE), 802.16d and 802.16e (WiMax). IPR contribution volume reached up to 50% of all Nortel patent filings.
- Prepared a technical proposal for an 802.16j relay for the Nortel incubation board finally approved as an “angel- funded” project; initiated discussions with potential external partners.
- Led architectural development of HDR, Meshed cellular backhaul, Wireless Triple Play concepts, along with carrier teams. Meshed backhaul became part of the plan of record of the 4G business. HDR proposal was retained by SPRINT PCS as contender for 1xEv.
- Led team developing radio and antenna system for Nortel mesh 802.11a/g product targeted for municipal Wi-Fi.
- Engaged with Nortel product line managers to create new technology roadmaps. Successfully communicated these concepts to global Wireless customers and gained mindshare.
- Prepared aggregated design estimates, costs and supporting market figures for new product concepts.
- Developed and led new externalization programs to third party R&D labs (mostly located in Russia).
- Led the definition and prioritization of university research proposals funded by Nortel. These projects provided support to world class research teams in Canadian universities and abroad; research topics included Wireless system, coding and modulation, antennas, propagation.

**Senior Manager, Wireless Technology Labs**

**1997 – 2000**

- Led and prioritized standard contributions in definition of 3GPP/UMTS and on-going research on multi-user detection, space-time coding, channel coding, equalization, interference cancellation and soft handover for application to IS-2000, UMTS and EDGE air interfaces. The contributions became the most lucrative sources of licensing fees for Nortel in the Wireless area.
- Led the development of IS-2000 Alpha base station software modem resulting in the world first 1x Voice IOT; achieved in partnership with Samsung and Bell Mobility.
- Led technical definition of SW configurable base-station supporting GSM, IS-136 and IS-95.

**Manager, IS-136 TDMA Development**

**1994 -1996**

- Editor for High Level Design of Nortel third generation IS-136 radio HW & SW.
- Led design and delivery of Nortel CDPD (narrowband packet data) base-station programmable personality, within the constraints of pre-existing platforms and network architecture.
- Field trial support for initial IS-136 deployment of Israel Cellcom, resolved of high profile issues.

- Managed development of network capacity improvement features. Successfully communicated value of radio features to customers at Nortel user group meetings.
- Assembled and trained the largest DSP team in Nortel.

#### **DSP System Designer, IS-136 TDMA Development**

**1988 – 1994**

- Designed algorithms, simulated the performance of wireless packet data CDPD, AMPS and IS-136 transceiver on Nortel software defined radio platform (TRU); implemented embedded SW on multi-processor DSP.
- Provided support for resolution of field problems for TDMA, AMPS and Data over AMPS applications.

#### **EDUCATION**

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Continuing Education: IEEE, Nortel and RIM in-house management training, graduate courses at Carleton University and Schulich School of Business, regular technical conference & business trade show attendance.

#### **UNIVERSITY OF TORONTO**

**Master of Applied Science, Electrical Engineering, 1987**

#### **UNIVERSITÉ LAVAL**

**Baccalaureate, Engineering Physics, 1985**

- Exchange student in 1985 with School of Engineering, University of Massachusetts at Amherst.

#### **PROFESSIONAL MEMBERSHIPS, AWARDS AND INTERESTS**

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- Senior Member of IEEE, Communication Society, member of Ordre des Ingénieurs du Québec (Professional Engineer).
- Awarded Nortel Networks Platinum talent status, consistently obtained top contribution codes; Northern Telecom award for customer service.
- 2 publications and 17 patents in the area of Wireless.
- Fluent in both English and French (written and spoken).

#### **REFERENCES**

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Dr. Al Javed, Nortel Fellow Emeritus, former Nortel VP of Technology; Tel: 613.298.5783; [aljaved@javedwireless.com](mailto:aljaved@javedwireless.com)  
Other references are available on request.